



10/663,416  
34019US

***IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF APPEALS AND INTERFERENCES***

In re Application of: Bruce B. Randolph, Marvin M. Johnson and Glenn W.  
Dodwell

Serial No.: 10/663,416

Group Art Unit: 1755

Filed: September 16, 2003

Examiner: Jennine M. Brown

For: ISOPARAFFIN-OLEFIN ALKYLATION

***APPELLANTS' BRIEF ON APPEAL***

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In response to the Notice of Appeal, which was mailed on March  
6, 2006, the Appellant respectfully submits this Appeal Brief. Appellants  
respectfully request that the claims in question be allowed.

***Real Party of Interest***

ConocoPhillips Company, formerly known as Phillips Petroleum  
Company, is the assignee of record of the above-captioned Application and,  
thus, is the real party of interest in this Appeal.

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***Related Appeals and Interferences***

It is believed that there are no appeals or interferences, which will directly affect or be directly affected by or have a bearing on the Board Decision on this Appeal.

***Status of Claims***

Appellants appeal the Final Rejection of pending claims 1-9.

***Status of Amendments***

The Final Office Action was mailed on September 7, 2005, wherein the Examiner finally rejected the above claims. A Response after Final was mailed on November 15, 2005. The Examiner maintained the final rejection of the claims in an Advisory Action mailed December 29, 2005. A Notice of Appeal was mailed on March 6, 2006, along with a request for consideration in the pre-appeal brief conference pilot program. A Notice of Final Decision stating to proceed with the Appeal was mailed on April 20, 2006.

***Summary of the Claimed Subject Matter***

The present invention relates to a composition suitable for use as an alkylation catalyst comprising, consisting of, or consisting essentially of an acid component and a polymer (*see, e.g.*, page 3, lines 17-20). The acid component is selected from the group consisting of 1) a sulfuric acid, 2) a fluorosulfonic acid, 3) a perhaloalkylsulfonic acid, 4) an ionic liquid, 5)

mixtures of Bronsted acids and Lewis Acids, and 6) combinations thereof (*see e.g.*, page 4, lines 1-6). The polymer is preferably a polyacrylate (*see, e.g.*, page 5, lines 19-20).

***Grounds of Rejection to be Reviewed on Appeal***

The grounds of rejection to be reviewed on appeal are:

Whether claims 2-3 are unpatentable under 35 U.S.C. 112, 2<sup>nd</sup> paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Whether claims 1-7 are unpatentable under 35 U.S.C. 102(b) as being anticipated by Aumuller et al. (U.S. 5,714,611);

Whether claims 1-9 are unpatentable under 35 U.S.C. 102(b) as anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over Aumuller (U.S. 5,914,360); and

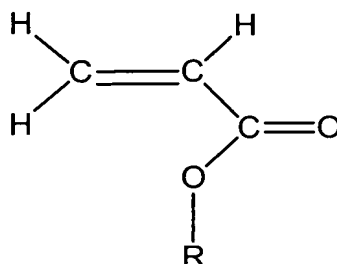
Whether claims 1 and 5 are unpatentable under 35 U.S.C. 102(b) as being anticipated by Hlatky (W.O. 01/81436 A1).

***Arguments***

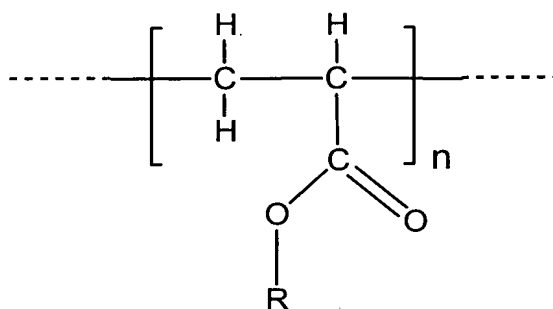
**The § 112 Rejection of Claims 2-3**

The Examiner states “. . . R is the terminal group before chain propagation and if it is a polyacrylate it cannot be hydrogen because it would be a monomeric acid and not a polymeric ester group according to the formula given in claim 1 (*see* Final Office Action, page 2).”

Applicants respectfully disagree. The monomer is as follows:



The double bond polymerizes and several of these monomers bond together to form a polymer:



Therefore, “R” can still be hydrogen when the monomer is part of the polymeric chain; “R” does not take part in the polymerization process.

The “n” in the structure and in the instant claims denotes the number of building blocks/monomers in the resulting polymer. Applicants believe the formula given in the claims satisfies the 35 U.S.C. 112 requirements.

### **The § 102(b) Rejection of Claims 1-7.**

Aumuller (U.S. 5,714,611) discloses a process to prepare N,N'-bridged compounds (*see* col. 1, lines 7-9). These compounds can be prepared by reacting tetramethylpiperidine compounds with a cyclic carbonate (*see* col. 2, lines 50-60). This reaction can be carried out with a catalyst. The catalyst can be a sulfonic acid catalyst (*see* col. 6 lines 1-13). A polymer is not one of the catalyst components listed.

Aumuller '611 states "The novel compounds Ia as well as the compounds I and Ib are very suitable for stabilizing organic material to the effect of light, oxygen, and heat" (*see* Aumuller '611, col. 7, lines 48-50).

A catalyst, which can be a sulfuric acid catalyst, can be used to produce the compound I, which is the N,N'-bridged bistetramethylpiperidenyl compound with the formula as shown in col. 1, lines 10-16 of Aumuller.

Aumuller '611 further states that compound Ia is the compound which can stabilize polymers (*see* generally, Aumuller '611, col. 8, lines 56-67 to col. 9, lines 1-17). Compound Ia is a variation of compound I, and its formula is shown at col. 7 lines 1-8 of Aumuller '611. As is taught in general chemistry, a catalyst increases the rate of a reaction, but is not actually consumed in the reaction. Therefore, the sulfonic acid catalyst is not a part of the final reaction product Ia and is not present when Ia is used to stabilize polymers.

Aumuller '611 does not disclose Applicants' invention, a composition containing an acid component and a polymer and Applicants argue that the Aumuller '611 reference has been misinterpreted to read otherwise.

### **The 102/103 Rejections of Claims 1-9**

The Aumuller '360 reference (U.S. 5,914,360) discloses a process to prepare N,N'-bridged bistetramethylpiperidiny compounds (*see* Aumuller '360, col. 1, lines 8-10). This process can be carried out with a catalyst. The catalysts listed include sulfonic acid catalysts (*see* Aumuller '360, col. 6, lines 19-30). However, the catalyst does not contain a polymer, as required in the instant claims. Aumuller '360 does not disclose and Applicants have not found a catalyst containing a polymer.

The Examiner states "Aumuller, et al. disclose an acid catalyst composition . . . , heavy metal catalysts . . . and organic catalysts . . . used in an amount from 0.01 to 25 mole percent and are used to stabilize alkyl acrylate copolymers, alkyl methacrylate copolymers and other polymers (col. 6, l. 1 – col. 7, l. 54; col. 8, l. 56 – col. 9, l. 17)." (*see* Office action, page 5, 3<sup>rd</sup> paragraph).

However, the compound Ia in the reference that the Examiner is referring to, (the structure of which is found in col. 7, lines 15-25) is a compound which can stabilize copolymers (*see* col. 9 lines 7-16). Compound Ia is one of the products made by the Aumuller '360 process. It would not be obvious to use the information in Aumuller '360 to deduce a catalyst containing both an acid and a polymer by using the information provided in Aumuller '360.

### **The 102 Rejection of Claims 1 and 5**

Hlatky (W.O. 01/81436 A1) discloses "polymerizing one or more olefins in the presence of a single-site catalyst, an optional activator, and an ionic liquid." (*see* Hlatky, page 3, 3<sup>rd</sup> paragraph). The single site catalyst is an organometallic complex with a Group 3 to 10 metal or a lanthanide or actinide metal (*see* Hlatky, page 4, 3<sup>rd</sup> paragraph). The complex can also include polymerization-stable anionic ligands (*see* Hlatky, page 4, 4<sup>th</sup> paragraph).

Hlatky does not disclose, and Applicants have not found, a composition comprising an acid component and a polymer.

Hlatky discloses a polymerization process performed in the presence of an ionic liquid (*see* page 6, line 3). This polymerization process is in the presence of a catalyst. The catalyst is an organometallic complex (*see* page 4, line 5). In

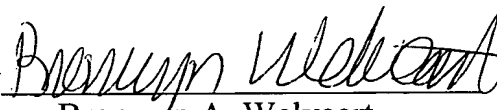
Example 2 of Hlatky "polyethylene, the expected reaction product, collects on the surface of the ionic liquid and is easily isolated." (see page 10, lines 24-25).

Applicants, therefore, argue that the two components are separate entities, and not a single composition is claimed in the instant claims.


Based on the foregoing remarks, it is respectfully suggested that claims 1-9 are patentable over the prior art. Reversal of the Final Rejection of claims 1-9 is respectfully requested.

Respectfully submitted,

CONOCOPHILLIPS COMPANY -  
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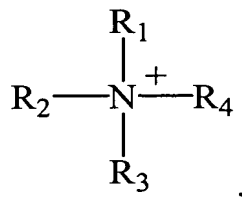
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<p style="text-align: center;">CERTIFICATE OF MAILING</p> <p>I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450, on</p> <p style="text-align: center;"><u>20 June 2006</u></p> <p style="text-align: center;">(Date)</p> <p style="text-align: center;"> Bronwyn A. Welvaert</p>
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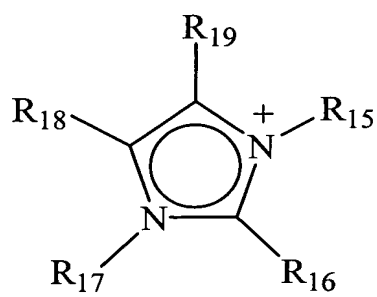
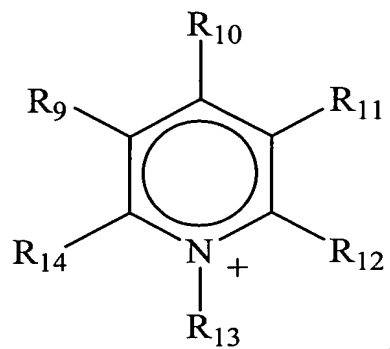
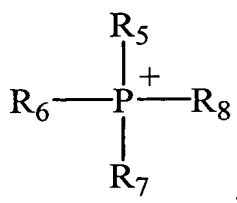
Claims Appendix

**THAT WHICH IS CLAIMED:**

1. (Original) A composition comprising:
  - a) an acid component selected from the group consisting of 1) a sulfuric acid, 2) a fluorosulfonic acid, 3) a perhaloalkylsulfonic acid, 4) an ionic liquid, 5) mixtures of Bronsted acids and Lewis acids, and 6) combinations of any two or more thereof; and
  - b) a polymer.
2. (Original) A composition in accordance with claim 1 wherein said polymer is a polyacrylate having a formula of  $[-CH_2-CH(CO_2R)-]_n$  where R is a Group IA element.
3. (Original) A composition in accordance with claim 2, wherein said Group IA element is hydrogen.
4. (Original) A composition in accordance with claim 1 wherein said acid component is trifluoromethanesulfonic acid.
5. (Original) A composition in accordance with claim 1 wherein said ionic liquid comprises a cation and an anion; wherein said cation is selected from the group consisting of ions defined by the formulas:







and combinations of any two or more thereof, wherein:

$\text{R}_1$ ,  $\text{R}_2$ ,  $\text{R}_3$ ,  $\text{R}_5$ ,  $\text{R}_6$  and  $\text{R}_7$  are selected from saturated and unsaturated hydrocarbons containing from 1 to 7 carbon atoms per molecule;

$\text{R}_4$ ,  $\text{R}_8$ ,  $\text{R}_9$ ,  $\text{R}_{10}$ ,  $\text{R}_{11}$ ,  $\text{R}_{12}$ ,  $\text{R}_{13}$ ,  $\text{R}_{14}$ ,  $\text{R}_{15}$ ,  $\text{R}_{16}$ ,  $\text{R}_{17}$ ,  $\text{R}_{18}$ , and  $\text{R}_{19}$  are selected from saturated and unsaturated hydrocarbons containing from 1 to 7 carbon atoms per molecule, and hydrogen; and

wherein said anion is selected from the group consisting of halides of:

Group IIIA metals, copper, zinc, iron and phosphorus.

6. (Original) A composition in accordance with claim 1 wherein said mixtures of Bronsted acids and Lewis acids comprise a Bronsted acid selected from the group consisting of hydrofluoric acid, sulfuric acid, trifluoromethane sulfonic acid, and combinations of any two or more thereof.

7. (Original) A composition in accordance with claim 1 wherein said acid component is present in said composition in a range of from about 5 weight percent to about 90 weight percent based on the total weight of said composition.

8. (Original) A composition in accordance with claim 1 wherein said acid component is present in said composition in a range of from about 30 weight percent to about 85 weight percent based on the total weight of said composition.

9. (Original) A composition in accordance with claim 1 wherein said acid component is present in said composition in a range of from about 50 weight percent to about 80 weight percent based on the total weight of said composition.

10. (Withdrawn) A method for making a composition, said method comprising the step of:

admixing an acid component selected from the group consisting of 1) sulfuric acid, 2) a fluorosulfonic acid, 3) a perhaloalkylsulfonic acid, 4) an ionic liquid, 5) mixtures of Bronsted acids and Lewis acids, and 6)

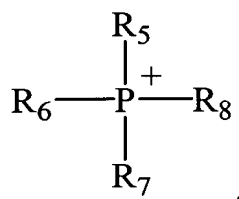
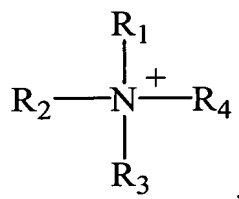
combinations of any two or more thereof and a polymer, to form a mixture thereof.

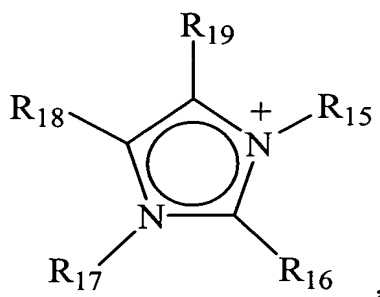
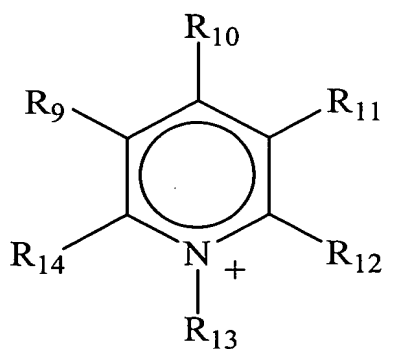
11. (Withdrawn) A method in accordance with claim 10 wherein said polymer is a polyacrylate having a formula of  $[-CH_2-CH(CO_2R)-]_n$  where R is a Group IA element.

12. (Withdrawn) A method in accordance with claim 11 wherein said Group IA element is hydrogen.

13. (Withdrawn) A method in accordance with claim 10 wherein said base component is trifluoromethanesulfonic acid.

14. (Withdrawn) A method in accordance with claim 10 wherein said ionic liquid comprises a cation and an anion; wherein said cation is selected from the group consisting of ions defined by the formulas:





and combinations of any two or more thereof, wherein:

R<sub>1</sub>, R<sub>2</sub>, R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> are selected from saturated and unsaturated hydrocarbons containing from 1 to 7 carbon atoms per molecule;

R<sub>4</sub>, R<sub>8</sub>, R<sub>9</sub>, R<sub>10</sub>, R<sub>11</sub>, R<sub>12</sub>, R<sub>13</sub>, R<sub>14</sub>, R<sub>15</sub>, R<sub>16</sub>, R<sub>17</sub>, R<sub>18</sub>, and R<sub>19</sub> are selected from saturated and unsaturated hydrocarbons containing from 1 to 7 carbon atoms per molecule, and hydrogen; and

wherein said anion is selected from the group consisting of halides of:

Group IIIA metals, copper, zinc, iron and phosphorus.

15. (Withdrawn) A method in accordance with claim 10 wherein said mixtures of Bronsted acids and Lewis acids comprise a Bronsted

acid selected from the group consisting of hydrofluoric acid, sulfuric acid, trifluoromethane sulfonic acid, and combinations of any two or more thereof.

16. (Withdrawn) A method in accordance with claim 10 wherein said acid component is present in said composition in a range of from about 5 weight percent to about 90 weight percent based on the total weight of said composition.

17. (Withdrawn) A method in accordance with claim 10 wherein said acid component is present in said composition in a range of from about 30 weight percent to about 85 weight percent based on the total weight of said composition.

18. (Withdrawn) A method in accordance with claim 10 wherein said acid component is present in said composition in a range of from about 50 weight percent to about 80 weight percent based on the total weight of said composition.

19. (Withdrawn) A process comprising contacting under suitable alkylation reaction conditions a hydrocarbon mixture comprising olefins and paraffins with a composition prepared by the method of claim 10.

20. (Withdrawn) A process in accordance with claim 19 wherein said base component is selected from the group consisting of 1) a sulfuric acid, 2) a fluorosulfonic acid, 3) a perhaloalkylsulfonic acid, 4) an

ionic liquid, 5) Bronsted acid and Lewis acid mixtures and 6) combinations of any two or more thereof.

21. (Withdrawn) A process in accordance with claim 20 wherein said base component is trifluoromethanesulfonic acid.

22. (Withdrawn) A process in accordance with claim 19 wherein said polymer is a polyacrylate having a formula of  $[-CH_2-CH(CO_2R)-]_n$  where R is a Group IA element.

23. (Withdrawn) A process in accordance with claim 22 wherein said Group IA element is hydrogen.

24. (Withdrawn) A process in accordance with claim 19 wherein said base component is present in said composition in an amount in the range of from about 5 to about 90 weight percent of the total weight of said composition.

25. (Withdrawn) A process in accordance with claim 19 wherein said base component is present in said composition in an amount in the range of from about 30 to about 85 weight percent of the total weight of said composition.

26. (Withdrawn) A process in accordance with claim 19 wherein said base component is present in said composition in an amount in the range of from about 50 to about 80 weight percent of the total weight of said composition.

27. (Withdrawn) A process in accordance with claim 19 wherein the alkylation reaction temperature is in the range of from about 5°C to about 150°C and the alkylation reaction pressure is in the range of from about ambient pressure to about 50 atmospheres.

28. (Withdrawn) A process in accordance with claim 19 wherein the molar ratio of paraffin to olefin in said hydrocarbon mixture is in the range of from about 2 to 1 to about 25 to 1.

29. (Withdrawn) A process in accordance with claim 19 wherein said olefins are mono-olefins having from 2 to 12 carbon atoms, and wherein said paraffins are isoparaffins having from 4 to 8 carbon atoms.